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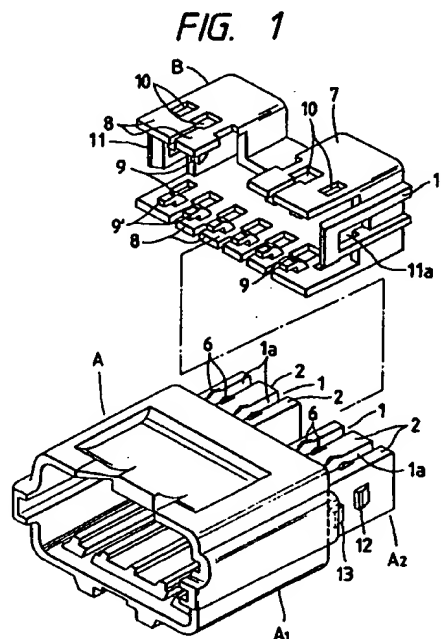
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(54) Connector with terminal holder.

(57) In this connector, metal terminals (C) are held by a terminal holder (B), connectable to a connector housing (A), so as to stabilize the position of each metal terminal, thereby facilitating the fitting thereof with its mating metal terminal. The connector housing, for receiving metal terminals, and the terminal holder are connected in a two-stage manner, that is, first in a provisionally-connected condition and then in a completely-connected condition. In the provisionally-connected condition, a flexible deformable plate (8) of the terminal holder rests on push-up projections (6) of the connector housing thereby allowing the insertion and withdrawal of a metal terminal (C) relative to a respective terminal receiving chamber (1). In the completely-connected condition, a terminal holding portion (9) on the flexible deformable plate (8) is biased against and fixes a respective metal terminal (C) in position.



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This invention relates to a connector used mainly for connecting a wire harness of an automobile, and more particularly to a connector having a terminal holder provided at a rear portion thereof.

In Fig. 8, a connector housing a includes a hood portion  $a_1$  and a terminal receiving portion  $a_2$ , and metal terminals  $c$  are received in terminal receiving chambers  $b$ . A retaining member  $d$  is releasably attached to the terminal receiving portion  $a_2$  from the rear end thereof to cover the outer surface thereof, and this retaining member is fixed by engaging a lock arm  $e$  with a projection  $f$ .

In a condition (Fig. 9) in which the connector housing  $a$  and the retaining member  $d$  are connected together, projections  $h$  formed on flexible deformable plates  $g$  extend respectively through slits  $i$  into the terminal receiving chambers  $b$  to engage stepped portions of the metal terminals  $c$ , respectively, thereby preventing rearward withdrawal of these metal terminals.

In the above conventional art, the retaining of the metal terminal in the terminal receiving chamber is unstable, and the metal terminal is subjected to lateral shaking, and therefore it is difficult to properly maintain the posture of fitting of the metal terminal with its mating metal terminal. As a result, when connecting the connector housings together, the end faces of the female and male metal terminals are liable to impinge on each other, which causes withdrawal of the terminal and an imperfect contact.

With the above problem in view, the present invention is intended to stabilize the posture of metal terminals by means of a connecting member which is connected to a connector housing to hold the metal terminals.

To achieve the above object, according to the present invention, there is provided a connector with a terminal holder characterized in that the connector comprises a connector housing receiving metal terminals therein, and a terminal holder connected to said connector housing in a two-stage manner, that is, first in a provisionally-connected condition and then in a completely-connected condition; in the provisionally-connected condition, a flexible deformable plate of said terminal holder allows the insertion and withdrawal of the metal terminal, and in the completely-connected condition, a terminal holding portion on said flexible deformable plate urges and fixes the metal terminal.

In the completely connected condition, the flexible deformable plate of the terminal holder abuts against the surface of the metal terminal to urge the same, thereby preventing lateral shaking of the metal terminal.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an exploded perspective view of one embodiment of the present invention;

Fig. 2 is a cross-sectional view of the above embodiment in a provisionally-connected condition;

Fig. 3 is a cross-sectional view of the above embodiment in the process of shifting to a completely-connected condition;

Fig. 4 is a cross-sectional view of the above embodiment in the completely-connected condition;

Fig. 5 is an enlarged view of an important portion of the above embodiment;

Fig. 6 is a cross-sectional view of a modified construction in a completely-connected condition;

Fig. 7 is an enlarged perspective view of an important portion of the modified construction;

Fig. 8 is an exploded perspective view of a conventional construction; and

Fig. 9 is a cross-sectional view of the conventional construction in a connected condition.

In Figs. 1 to 4, each of a connector housing  $A$  and a terminal holder  $B$  is integrally formed of a synthetic resin.

The connector housing  $A$  has a hood portion  $A_1$  at its front half portion, and a terminal receiving chamber block  $A_2$  at its rear half portion, and the peripheral wall of the connector housing is removed at the rear half portion.

Wall plates  $2$  and  $2$  are provided at opposite sides of each terminal receiving chamber  $1$ , respectively. Between the wall plates  $2$  and  $2$ , each terminal receiving chamber  $1$  is open rearwardly and upwardly or downwardly (the direction perpendicular to the axial direction in the drawings) as at  $1a$ . Each terminal receiving chamber  $1$  has a flexible retaining piece  $3$  for a metal terminal  $C$ , and has a terminal insertion hole  $5$  which is provided through an intermediate partition wall  $4$  and is directed forwardly.

Push-up projections  $6$  are formed in a row on the outer surfaces of the wall plates  $2$ , and each projection  $6$  has a tapered surface disposed in the forward-backward direction.

The terminal holder  $B$  has a plurality of flexible deformable plates  $8$  which are formed in a cantilever fashion on upper and lower portions of a main frame portion  $7$  in such a manner as to correspond to the terminal receiving chambers  $1$ , the main frame portion  $7$  receiving the terminal receiving chamber block  $A_2$ . A terminal retaining projection  $9$  is formed on the inner surface of the flexible deformable plate  $8$ , and a relief notch  $10$  is formed at that portion disposed rearwardly of the terminal retaining projection  $9$ . A terminal holding portion  $9'$  extends forwardly from the terminal retaining projection  $9$ . As shown in Fig. 5, a slanting guide

surface 9d' is formed on the lower side of the terminal holding portion 9' at the front end thereof so as to prevent this terminal holding portion from impinging on an intermediate box-like portion 14 of the metal terminal C. Formed continuous with this slanting guide surface are a terminal urging surface 9c' and a terminal retaining surface 9a. When the terminal holder B is to be connected to the connector housing A, the flexible deformable plate 8 slides over the opposed wall plates 2 and 2 forming the terminal receiving chamber 1, and the terminal retaining projection 9 and the terminal holding portion 9' are projected into the terminal receiving chamber 1.

Housing retaining arms 11 each having a retaining hole 11a are formed respectively on the opposite sides of the main frame portion 7 of the terminal holder B in a forwardly-projecting manner. A provisionally-retaining projection 12 and a completely-retaining projection 13 are formed on each of the opposite outer wall plates 2 of the connector housing A, the projection 12 and the projection 13 being arranged in this order from the rear side to the front side of the connector housing, and being engageable with the housing retaining arm 11.

Fig. 2 is a cross-sectional view showing a provisionally-connected condition in which the housing retaining arms 11 of the terminal holder B are engaged with the provisionally-retaining projections 12 of the connector housing A, respectively. In this case, each flexible deformable plate 8 rests on the push-up projections 6, so that the terminal retaining projection 9 and the terminal holding portion 9' are disposed out of the path of insertion of the metal terminal C within the terminal receiving chamber 1, and therefore the metal terminal 1 is smoothly inserted, and is retained by the flexible retaining piece 3.

In this condition, when the terminal holder B is further pushed slightly, the push-up projections 6 are received in the relief notches 10, so that each flexible deformable plate 8 restores to bring the terminal retaining projection 9 and the terminal holding portion 9' deep into the terminal receiving chamber 1 (Fig. 3). When the terminal holder B is further pushed, the housing retaining arms 11 are engaged respectively with the completely-retaining projections 13, thereby achieving the completely-connected condition. In this case, the terminal retaining projection 9 is positioned at the rear of the intermediate box-like portion 14 of the metal terminal C, thereby retaining the metal terminal C in a double manner, and at the same time the terminal holding portion 9' rests on the intermediate box-like portion 14 of the metal terminal C to urge the same under the resiliency of the flexible deformable plate 8, thereby fixing the metal terminal C (Fig. 4).

Fig. 6 shows a completely-connection condition of another construction, and in this case a terminal holding portion 9' is press-fitted between an engaging wall 15 of a connector housing A and the intermediate box-like portion 14 of the metal terminal C, thereby fixing the metal terminal C. As shown in Fig. 7, an elongate push projection 9a', having a slanting guide surface 9b' at its front end, is formed on that surface of the terminal holding portion 9' facing the engaging wall 15, and with this arrangement, the press-fitting is facilitated.

As described above, in the present invention, the connector comprises the connector housing receiving the metal terminals therein, and the terminal holder connected to the connector housing in a two-stage manner, that is, first in the provisionally-connected condition and then in the completely-connected condition, and in the provisionally-connected condition, the flexible deformable plate of the terminal holder allows the insertion and withdrawal of the metal terminal, and in the completely-connected condition, the terminal holding portion on the flexible deformable plate urges and fixes the metal terminal. Therefore, in the provisionally-connected condition of the terminal holder, the metal terminal can be easily inserted into the terminal receiving chamber of the connector housing, and then the terminal holder is moved into the completely-connected condition to immediately fix the metal terminals, thereby stabilizing the fitting posture of the metal terminal.

#### Claims

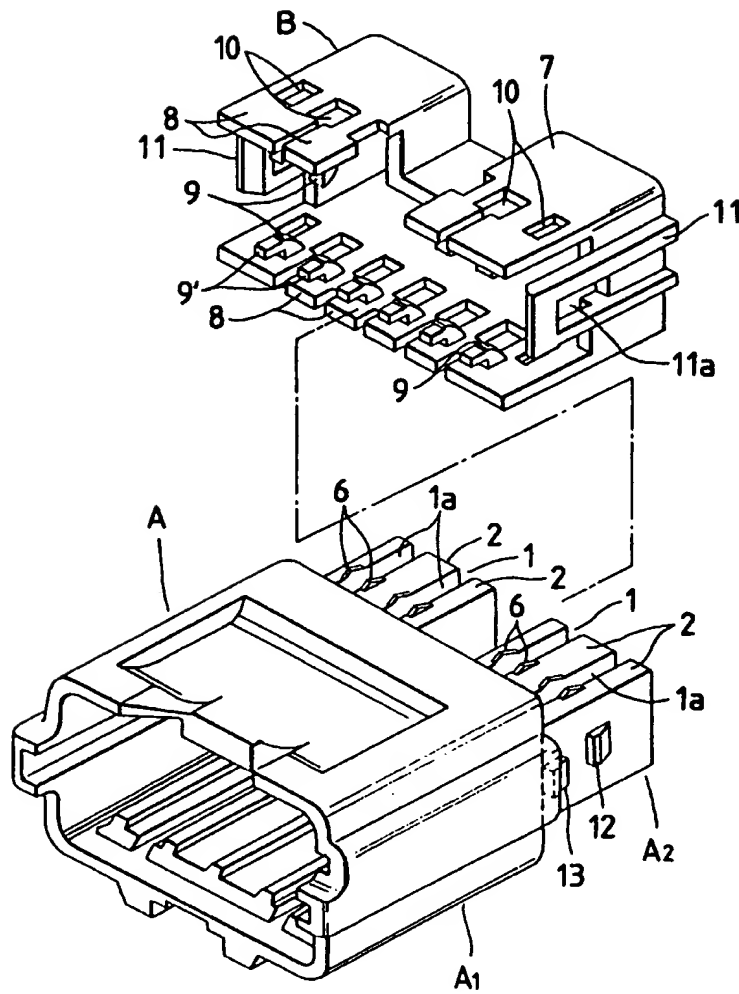
1. A connector comprising:
  - a plurality of metal terminals (C);
  - a connector housing (A) for receiving the metal terminals therein; and
  - a terminal holder (B) movably engagable with the connector housing in two positions, a provisionally fastened position and a completely fastened position, the terminal holder including a plurality of flexible deformable plates (8), each of which has a terminal retaining member (9), and
  - wherein each of the flexible deformable plates (8) allows insertion and withdrawal of the metal terminals (C) in the provisionally-fastened position, and the terminal retaining member (9) urges and fixes the metal terminals in the completely-fastened position.
2. A connector according to claim 1, wherein the connector housing (A) includes a plurality of projection members (6), and each flexible deformable plate (8) rests on a projection member for allowing insertion and withdrawal of the metal terminal in the provisionally-fastened

condition.

3. A connector comprising:
  - a plurality of metal terminals (C);
  - a connector housing (A) including a plurality of terminal receiving chambers (1) each of which is defined by a pair of opposite wall plates (2), each of the wall plates having a push-up projection (6); and
  - a terminal holder (B) movably engaged with the connector housing in two positions, a provisionally fastened position and a completely fastened position, the terminal holder having a plurality of flexible deformable plates (8) corresponding to respective terminal receiving chambers (1), each of the flexible deformable plates having a terminal retaining projection (9), wherein
    - when the terminal holder (B) is provisionally engaged with the connector housing (A), each of the push-up projections (6) pushingly abuts against the respective flexible deformable plate (8) so that a metal terminal (C) can be smoothly inserted and is then retained within the respective terminal receiving chamber (1), and
    - when the terminal holder (B) is completely engaged with the connector housing, the metal terminal (C) is urged by the terminal retaining projection (9).
4. A connector according to claim 3, wherein each of the metal terminals (C) has an insertion path; and the terminal holder (B) has a plurality of relief notches (10), and wherein
  - when the terminal holder is provisionally engaged with the connector housing (A), each of the flexible plates is flexed so that the terminal retaining projections (9) are disposed out of the insertion path; and
  - when the terminal holder is completely engaged with the connector housing, each of the push-up projections (6) is engaged with the relief notch (10) so that each of the flexible deformable plates (8) is restored, so as to bring the terminal retaining projections (9) deep into the terminal receiving chambers (1).
5. A connector according to claim 3 or claim 4, wherein each of the metal terminals (C) has a box-like portion (14) at an intermediate portion thereof, and wherein
  - when the terminal holder (B) is completely engaged with the connector housing (A), each of the terminal retaining projections (9) is disposed at the rear of the respective box-like member.

6. A connector according to claim 5, wherein a terminal holding projection (9') extends from each of the terminal retaining projections (9); and when the terminal holder is completely engaged with the connector housing, each terminal retaining projection (9') rests on the respective box-like portion (14) so that the box-like portion is urged by the flexible deformable plate (8) through the terminal retaining projection (9), thereby fixing the metal terminal in position.
7. A connector according to claim 5, wherein a terminal holding projection (9') extends from each of the terminal retaining projections (9); the connector housing (A) includes an engagement wall (15) therein; and the terminal holding projection (9') is press-fitted between the engagement wall and the box-like portion (14) when the terminal holder (B) is completely engaged with the connector housing.

FIG. 1



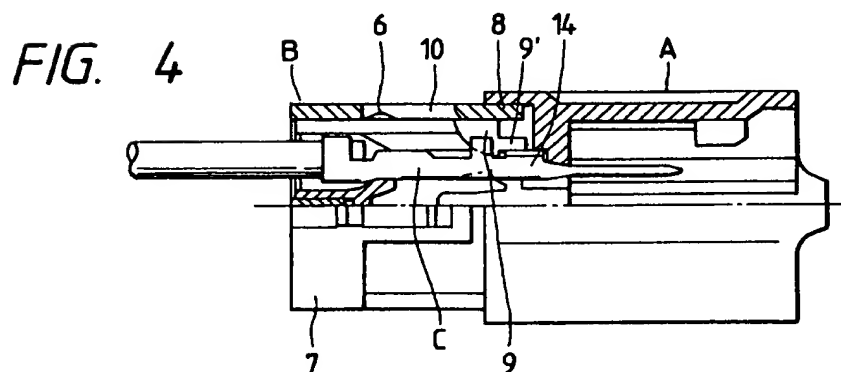
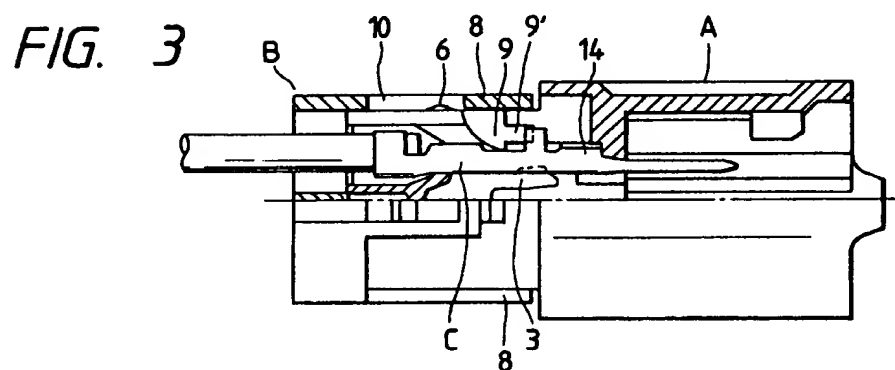
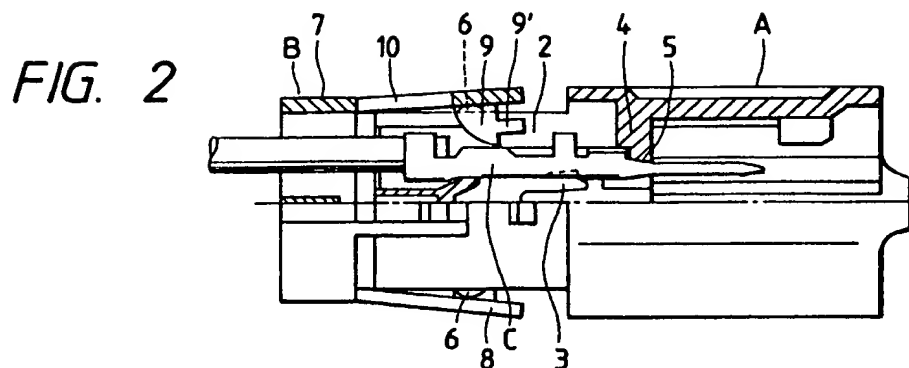


FIG. 5

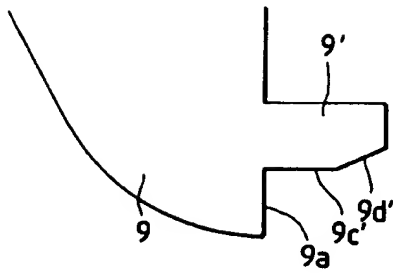


FIG. 7

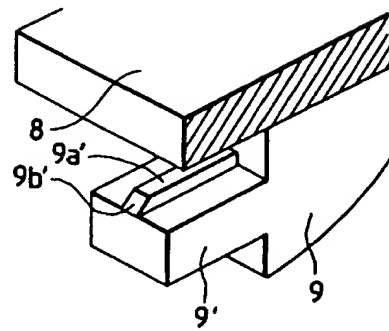
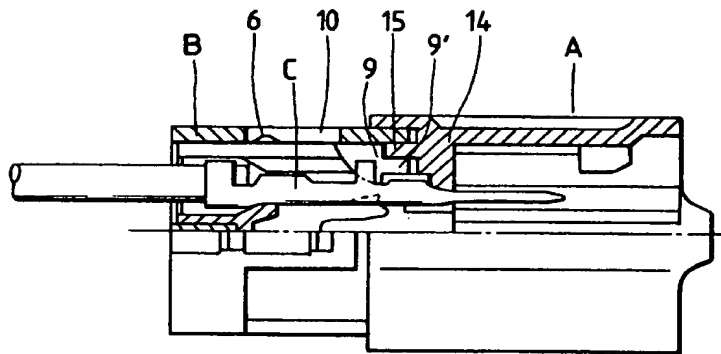
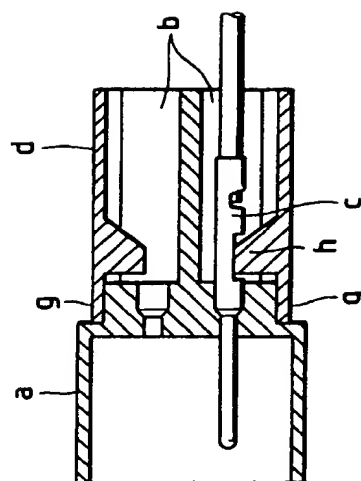
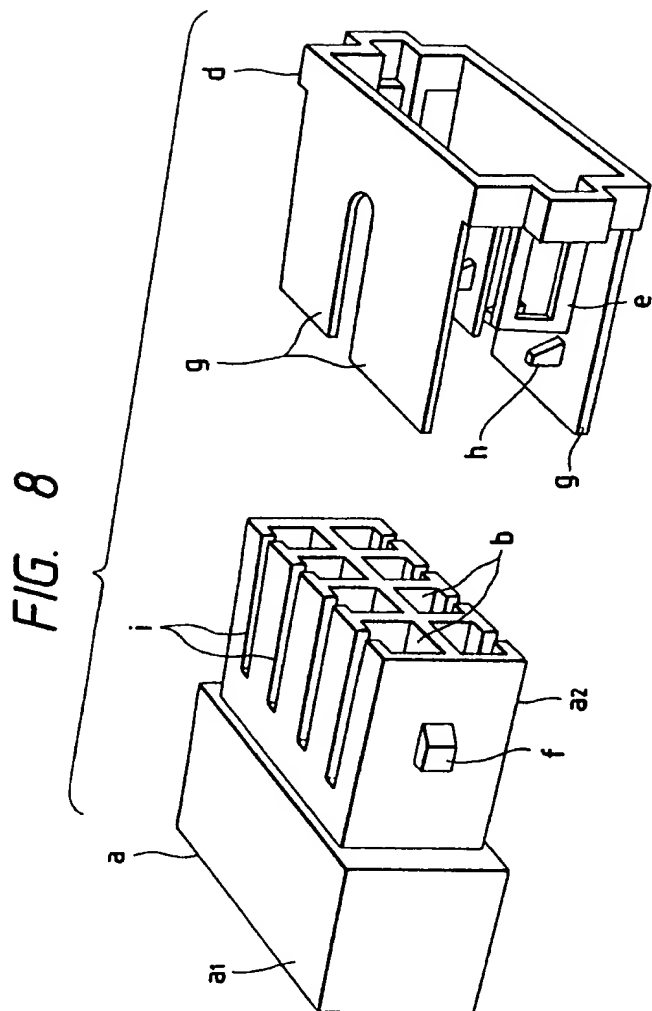


FIG. 6





**FIG. 9**





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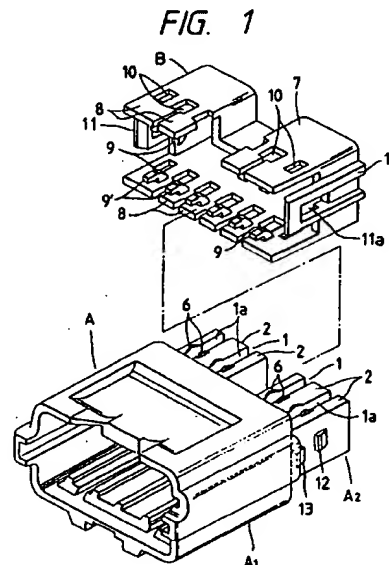
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## EUROPEAN SEARCH REPORT

Application Number

EP 92 30 2418

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
E	US-A-5 108 319 (YAZAKI CORPORATION) * the whole document * ---	1-7	H01R13/436
X	EP-A-0 113 809 (GROTE & HARTMANN GMBH & CO. KG) * page 5, line 22 - page 6, line 33; figures 3,4 * ---	1	
X	DE-A-3 839 014 (LEOPOLD KOSTAL GMBH & CO. KG) * column 2, line 16 - line 49; figures 1,2 * ---	1	
A	DE-A-4 006 437 (AMP INC.) * abstract; figures * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			H01R
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 08 JANUARY 1993	Examiner THIBAUT E.E.G.C.
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